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# Tutoring and academic performance of medical students.

# Las tutorías y el rendimiento académico de los estudiantes de medicina.

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**Summary.**

Current demands on higher education institutions necessitate the implementation of strategies aimed at strengthening teaching, among which academic tutoring stands out as a comprehensive support mechanism for students, with the potential to impact their academic performance. The objective of this study was to analyze the relationship between academic tutoring and academic performance in medical students. To this end, a systematic review of the scientific literature published between 2020 and 2024 was conducted, following the PRISMA 2020 guidelines for the identification, selection, and presentation of studies. The search was carried out in the Scielo, PubMed, Redalyc, and Dialnet databases, applying pre-established inclusion and exclusion criteria. In total, 12 articles from various countries were selected, primarily employing quantitative and qualitative methodological approaches, with sample sizes ranging from 6 to 2,920 students. Although several studies have reported that academic tutoring significantly influences students' academic performance, the available evidence has limitations associated with the methodological and conceptual heterogeneity of the research analyzed.

**Keywords:** university teaching, medicine, academic performance, tutoring.

**Resumen.**

Las demandas actuales de las instituciones de educación superior implican la implementación de estrategias orientadas al fortalecimiento de la docencia, entre las cuales destacan las tutorías académicas como un mecanismo de apoyo integral al estudiantado, con potencial impacto en su rendimiento académico. El objetivo del presente estudio fue analizar la relación existente entre las tutorías académicas y el rendimiento académico en estudiantes de medicina. Para ello, se llevó a cabo una revisión sistematizada de la literatura científica publicada entre los años 2020 y 2024, siguiendo las recomendaciones de la guía PRISMA 2020 para la identificación, selección y presentación de los estudios. La búsqueda se efectuó en las bases de datos Scielo, PubMed, Redalyc y Dialnet, aplicando criterios de inclusión y exclusión previamente establecidos. En total, se seleccionaron 12 artículos provenientes de diversos países, los cuales emplearon principalmente enfoques metodológicos cuantitativos y cualitativos, con tamaños muestrales que oscilaron entre 6 y 2 920 estudiantes. Si bien varios estudios reportaron que las tutorías académicas influyen de manera significativa en el rendimiento académico de los estudiantes, la evidencia disponible presenta limitaciones asociadas a la heterogeneidad metodológica y conceptual de las investigaciones analizadas.

**Palabras clave:** enseñanza universitaria, medicina, rendimiento académico, tutorías.

## 1. Introduction

Low academic performance is a problem affecting all countries within our cultural and economic sphere, a matter of concern for educational authorities and policymakers who, in budget adjustments, recognize that public spending on education is not yielding the expected results. Academic performance is defined as the degree of acquisition of planned knowledge in a subject in relation to educational objectives (1). In medical education, the personalization of the learning process is especially relevant, integrating values of inclusion, humanization, and self-evaluation, aimed at responding to the needs, expectations, and unique characteristics of students (2). A medical degree involves a heavy academic workload, evaluative pressure, and constant adaptation processes, which can negatively impact academic performance and student well-being (3). Even students with a history of academic success can face difficulties during their medical training, which can lead to academic vulnerability. Early identification of these difficulties is crucial, as poor academic performance during training can later impact professional practice (4). In the long and demanding path of medical education, even students with a prior history of academic success can face challenges that can affect their performance and eventually lead to academic vulnerability, preventing them from progressing in their studies. Only a small proportion of medical students experience deficiencies in their medical coursework. However, poor performance in the coursework is a major concern for medical educators, impacting students, faculty, and their programs (3). Early identification of difficulties in acquiring medical knowledge and skills is crucial to ensuring safe medical practice. The fact that struggling medical students also become struggling physicians underscores the importance of early identification and intervention for underperforming students (4).

One way to address these difficulties, and one that is applied in higher education, is through academic tutoring. Tutoring contributes to the development of curricular competencies and learning achievements, motivating students to complete activities throughout their studies. Therefore, the application of tutoring is necessary to increase learning outcomes and decrease the risk of student dropout (5). Research conducted in Nigeria highlights that, after analyzing 49 cases of medical students, peer tutoring intervention produced a significant improvement in scores, with an average increase of between 40% and 70% in those with low academic performance. Although overall changes in vitality and commitment were not significant, classroom participation improved (6).

However, other studies, such as the one conducted in Mexico, do not find a positive relationship between academic tutoring, student retention, and graduation. Nevertheless, they indicate a significant relationship between tutoring and academic performance, as 85.9% of 660 students enrolled in medical school due to vocational interests. However, they maintain that other variables, such as motivation rather than tutoring support, could influence students (7). In Peru, undergraduate medical education faces significant challenges, as these can be opportunities for intergenerational integration and the introduction of ICTs into the curriculum, making academic tutoring a useful tool in this regard (8). In Ecuador, academic tutoring is considered a core function of university processes, involving faculty members to provide guidance for the holistic development of students, addressing different areas of their personality development, as well as their academic, social, personal, and professional training (9).

In this context, it is important to highlight the significant impact of tutoring on higher education, particularly for medical students. This is because it involves a student in training and an established professional (faculty member) who must be part of the monitoring process and strategy to guide students throughout their university studies. The goal is to help students achieve mastery of knowledge and enhance their academic development, a process known as academic tutoring. For the purposes of this study, the analysis focuses exclusively on institutionalized academic tutoring, understood as the formal support provided by assigned faculty or tutors, aimed at academic monitoring, curriculum guidance, and strengthening the academic performance of medical students.

Based on this background, the objective of this research was to analyze the relationship between tutoring and the academic performance of medical students, through a systematic review of the scientific literature published between 2018 and 2024.

## 2. Methods

This study is a literature review of published material. The PRISMA 2020 guidelines were used in the systematic review, particularly regarding the search, screening, and eligibility of articles, which facilitated the selection of studies related to the impact of tutoring on the academic performance of medical students. The search strategy was applied using the keywords: tutoring, mentoring, higher education, medical students, academic performance, and academic achievement, with the support of the Boolean operator AND, through the search engines: SciELO, PubMed, Redalyc, and Dialnet. Predefined inclusion and exclusion criteria were applied, considering empirical studies published in Spanish or English between 2018 and 2024 that analyzed the relationship between tutoring and academic performance in medical students.

Methodological elements from PRISMA 2020 were adopted to conduct a rigorous systematic review. However, the marked methodological heterogeneity of the included studies, the conceptual differences in the definitions of tutoring, academic tutoring, mentoring, and academic performance, as well as the diversity of designs, sample sizes, and measurement instruments used, affected the intended systematicity. Consequently, this work is structured as a systematic literature review, focused on the narrative and contextual synthesis of the available evidence.

**Table 1.** Inclusion and exclusion criteria.

| Inclusion criteria | Exclusion criteria |
|---|---|
| • Empirical or primary studies based on academic tutoring and its impact on the performance of medical students.<br>• Studies focused on research in medical students.<br>• Quantitative, qualitative, descriptive, observational, analytical, and exploratory studies that include adequate definitions, reliable methods, and data analysis.<br>• Studies available in Spanish and English<br>• Studies published between 2020 and 2024. | • Non-empirical or secondary studies, such as reviews, editorials, theses, commentaries, and books.<br>• Studies that measure the incidence of academic tutoring in a population other than medical students.<br>• Studies focused on the validation and/or construction of instruments.<br>• Studies published in languages other than Spanish and English.<br>• Studies on academic tutoring and academic performance of medical students prior to 2020 and after 2024. |

The selected studies were characterized in a table with the following variables: Author/citation, year of publication, country, study design, measurement technique, sample, and main results. The study selection process was presented using the flowchart suggested by the PRISMA 2020 statement.

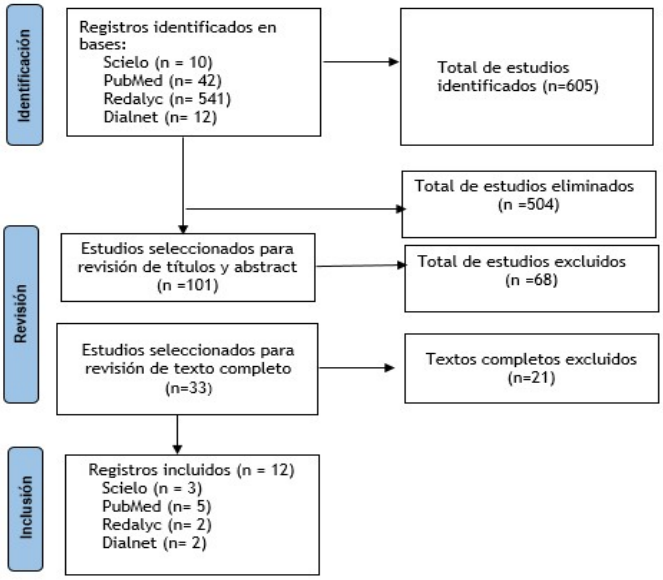


**Figure 1.** Flowchart of the search and selection process

## 3. Results

A total of 605 studies published up to 2024 were identified in the systematic review (10 studies from SciELO, 42 from PubMed, 541 from Redalyc, and 12 from Dialnet). After filtering by titles and abstracts, 68 studies were excluded for not meeting the inclusion criteria. Thirty-three studies were obtained for full-text review. Of these, 12 were selected after meeting the inclusion criteria and were included in this literature review (see figure 1). The main reasons for exclusion were: study populations other than medical students, lack of measurement of the impact of academic tutoring on medical student performance, application of non-empirical methodologies, and studies whose results were not aligned with the search objective. Table 2 presents a summary of the characteristics of each study selected for the review.

The selected studies were published between 2020 and 2024, thus encompassing more up-to-date literature. The studies included were conducted in the following countries: United States (3), Belgium (1), Mexico (4), Brazil (1), Chile (2), and Ecuador (1). The methodology used in 50% of the studies was both quantitative and qualitative (mixed). Surveys were used in 75% of the studies, and the minimum sample size analyzed was 6, while the maximum was 2,920 students.

## 4. Discussion

According to the reviewed studies, tutoring helped students build self-confidence, making it an enriching experience for tutors and aiding them in their learning process (10). Tutoring programs serve as a form of positive feedback for both students and academic tutors. In this sense, close monitoring and interventions by tutors helped break the cycle of poor student performance. Therefore, tutoring is fundamental not only as a strategy to help struggling students develop their potential, but also to broaden faculty perspectives on the difficulties students face in their academic lives (11).

Tutoring involves educating, assessing, and academically challenging medical students and includes support in subject matter knowledge, goal setting, skills development, and professional guidance. A study conducted in California suggests that tutoring helped third-year medical students adopt new habits that contributed to success in specialized and challenging environments (14). Higher-performing students have greater participation in peer tutoring programs, showing beneficial effects. On the one hand, faculty improved their competencies as medical experts, collaborators, and

academic and professional staff. However, regarding students, these authors identified that the improvement in performance was not due to their participation in tutoring programs, as there was a selection bias: the highest-performing students were those who applied for the program (12).

Tutoring is perceived by medical students at the Autonomous University of Mexico as an activity that has allowed them to identify the empathy and effectiveness of teachers in the teaching process, which led to an improvement in their academic performance, since this activity, unlike other teaching actions, promotes a close, instructive and formative relationship between the teacher-tutor and the students, constituting a fundamental strategy in the teaching-learning process in universities (13).

Another study also conducted in this location mentions that attendance at tutoring sessions improved the academic performance of first-year medical students, whose correlation analysis indicated that the frequency with which students attend tutoring sessions had a positive impact on overall weighted averages, that is, an increase in the number of peer tutoring sessions attended corresponds to an increase in the academic performance of the students (16).

On the other hand, some studies argue that tutoring does not directly impact the academic performance of medical students, due to the lack or poor implementation of these strategies that reinforce the areas where students need to improve to achieve higher academic performance (17). Support and the role of the tutor are fundamental in the academic process, as a study conducted in Chile showed that students receiving tutoring strengthened their study habits and improved their academic performance, which contributed to increased motivation and the development of positive social relationships. Thus, the authors highlighted a statistically significant relationship between the perception of support received and academic performance (18).

However, the evidence analyzed has significant methodological limitations. In some studies, the positive effects on academic performance may be influenced by selection bias, since higher-achieving students tend to participate more frequently in tutoring programs (12,16). Furthermore, the diversity of approaches and definitions makes direct comparison of results difficult. These findings reinforce the need to interpret the results with caution and to consider the institutional context, the tutoring modality, and the characteristics of the student population when evaluating the impact of these strategies.

## 5. Conclusions

- Academic tutoring has a positive impact on the academic performance of medical students, as it constitutes a formative strategy that strengthens the learning process, promotes self-confidence, motivates active participation in the educational environment, and facilitates adaptation to the demands of the medical career.
- Although some studies presented contradictory results, most show a significant improvement in academic averages and in the personal and professional skills of students who participate in tutoring programs, particularly when they are carried out in a planned manner, with follow-up and with committed teacher support.
- Based on the findings presented in this systematic review, an opportunity was identified for future lines of research aimed at deepening our understanding of the relationship between academic tutoring and the performance of medical students. It is important to develop longitudinal studies that evaluate the sustained effects of tutoring throughout a medical career. Furthermore, these studies could integrate psycho-emotional, motivational, and contextual variables that are inherent in the effectiveness of different types of tutoring and their adaptation to institutional and cultural environments.

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**Table 2.** Description of the systematized work.

| Author, citation | Year | Country | Study design | Measurement technique | Sample | Main results |
|---|---|---|---|---|---|---|
| Vidal et al. (10) | 2021 | Chili | Descriptive, cross-sectional, observational and exploratory | Opinion survey with Likert scale and open-ended questions | 12 tutors<br>35 students | High level of satisfaction in both groups. The tutoring sessions boosted students' self-confidence. |
| Lecerda et al. (11) | 2021 | Brazil | Descriptive, qualitative | Academic tutoring program of the Faculty of Medicine of the University of Sao Paulo | 21 teachers<br>55 students | Close monitoring and interventions by tutors made it possible to interrupt the cycle of poor student performance. |
| Avonts et al. (12) | 2022 | Belgium | Mixed, retrospective cohort study | CanMEDS Competency-Based Inventory Questionnaire, group interviews | 311 students<br>78 teachers | Medical students with better academic performance are more likely to participate in a peer mentoring program |
| Hickman et al. (13) | 2022 | Mexico | Non-experimental cross-sectional | Academic Tutoring Scale of the Student Opinion Questionnaire on Teaching Practices (COPDE) | 1219 students | Students perceive teachers as empathetic and effective during tutoring sessions, which improves the educational process and has a positive impact on academic performance. |
| Wilton et al.(14) | 2021 | California, United States | Mixed | Survey of the complexity of academic habits | 2920 students | The results of this research suggest that peer mentoring in medical students can be an effective and scalable approach to promoting students' academic success. |
| García et al.(15) | 2019 | Mexico | Observational, analytical, cross-sectional and prospective | Questionnaire formulated of 22 items with Likert-type scale | 81 students | 60% of students were satisfied with the tutoring provided by the teachers |
| Khalil and Wright(16) | 2022 | California, United States | Analysis of covariance and correlation | Academic and tutoring reports | 208 students | Positive correlation between attendance frequency and overall weighted average of students |
| Bhatnagar et al. (21) | 2020 | USA | Quantitative and Cross-sectional | Anonymous online survey, | 265 students | 63% of students who received mentoring indicated that it was good or very good, with a significant impact on decisions regarding rotation, residency programs, and career paths. |
| Tosca(17) | 2023 | Mexico | Quantitative, descriptive | Survey | 54 students | 43% of students indicated that tutoring does not |

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|---|---|---|---|---|---|---|
| | | | | | | influence academic performance |
| Godoy et al.(18) | 2021 | Chili | Educational, exploratory, descriptive | Semi-structured in-depth interviews | 6 male and 2 female volunteer key informant students | Peer tutoring can play an important role in students' transition to their first year of university, especially by providing motivation, support, and study strategies. |
| Vives and Salazar(19) | 2023 | Mexico | Qualitative-Quantitative | Survey and Interview | 163 students | Improves performance and strengthens professional identity |
| Tixilema and Ochoa(20) | 2024 | Ecuador | Qualitative | Survey | 11 teachers<br>13 students | Tutoring contributes significantly to academic performance and student well-being |